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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,469	12/16/2003	Ramgopal Darolia	13DV-14273	1468
30952 7590 04/16/2007 HARTMAN AND HARTMAN, P.C. 552 EAST 700 NORTH VAIPARAISO, IN 46383			EXAMINER BURKHART, ELIZABETH A	
			ART UNIT	PAPER NUMBER
			1762	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/16/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/707,469	DAROLIA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Elizabeth Burkhart	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 21-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/16/03</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-20, drawn to a method, classified in class 427, subclass 248.1.
  - II. Claims 21-32, drawn to an apparatus, classified in class 118, subclass 715.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used for a materially different process such as etching.

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Gary Hartman on 9 April 2007 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21-32 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Oath/Declaration***

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The electronic signatures on the declaration are improper. A proper "S-signature" as defined in 37 CFR 1.4(d)(2) is a signature electronically or mechanically inserted between single forward slash marks. See MPEP 502.02.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rigney et al (US 2002/0172838) in view of Rigney et al ('038).

Rigney et al ('838) discloses a method of depositing a ceramic coating on a substrate wherein the ceramic coating comprises yttrium-stabilized zirconia (YSZ) and a third metal oxide such as lanthana or neodymia in order to reduce the thermal conductivity of the coating [0009]. The ceramic coating is deposited by EBPVD and has a columnar grain structure [0016]. The chamber is backfilled with oxygen. The coating may be deposited by simultaneously evaporating separate ingots of YSZ and metal oxide. Alternatively, the coating may be deposited by evaporating a single ingot containing YSZ and the metal oxide. Also, the coating may be deposited by evaporating an ingot of YSZ and evaporating a metal source so that the metal source is oxidized in the presence of oxygen to form the third metal oxide [0024].

Rigney et al ('838) does not disclose using a carbide compound as a source for the third metal oxide or that the ceramic coating also comprises carbon, a carbon-containing gas, and/or precipitates of the carbide compound.

Rigney et al ('038) discloses a method of depositing a ceramic coating on a substrate wherein the ceramic coating comprises YSZ and carbide-based precipitates. The coating is deposited by EBPVD and the chamber is backfilled with oxygen. The coating may be deposited by evaporating a single ingot containing YSZ and a carbide

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(Col. 5, lines 23-60). The carbide-based precipitates allow thinner thermal barrier coatings to be used, which reduces processing and material costs (Col. 3, lines 28-31).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use the carbide compound as suggested by Rigney et al ('038) as the source of the metal oxide of Rigney et al ('838) in order to produce carbide-based precipitates into the thermal barrier coating, which would allow thinner coatings to be used and would reduce processing and material costs.

Regarding Claims 3 and 12, it would have been obvious to use a carbide compound such as  $\text{LaC}_2$  and  $\text{NdC}_2$  in order to form the metal oxide such as lanthana and neodymia as suggested by Rigney et al ('838).

Regarding Claims 9-12, 18, and 19, it would have been obvious that a carbon-containing gas such as carbon dioxide or carbon monoxide would also be present in said thermal barrier coating because the oxidation of the  $\text{LaC}_2$  or  $\text{NdC}_2$  to produce lanthana or neodymia would produce byproducts such as a carbon-containing gas and/or carbide-based precipitates depending on the amount of oxygen introduced to the chamber.

Thus, claims 1-20 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Rigney et al ('838) and Rigney et al ('038).

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Burkhart whose telephone number is (571)

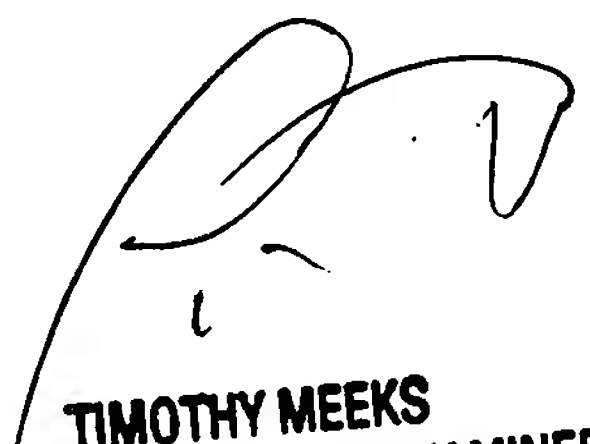
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272-6647. The examiner can normally be reached on Monday-Thursday, 7:00 AM-5:30 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

eab



**TIMOTHY MEEKS**  
**SUPERVISORY PATENT EXAMINER**